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**Abstract**

This study addresses the challenge of apple leaf disease classification by proposing an improved MobileNetV3 architecture. Apple leaf diseases significantly threaten production, and while deep learning shows promise, many models are computationally intensive. To overcome this, this study leverages MobileNetV3's efficiency and enhances its feature extraction. Improvements include a Multi-Scale Feature Extraction (MSFE) module in the initial layer and the replacement of the Squeeze-and-Excitation (SE) module with Selective Kernel Attention and Coordinate Attention. Evaluated on a comprehensive dataset of eight apple leaf condition classes, the proposed model achieved a notable accuracy of 97.88%. It outperformed baselines like ResNet50, EfficientNetB0, MobileNetV2, and the standard MobileNetV3, demonstrating superior parameter efficiency with only 3.1 million parameters. These results highlight the enhanced MobileNetV3 as an effective and lightweight solution for accurate apple leaf disease classification, suitable for real-time field deployment.

**Keywords:** MobileNetV3, apple leaf diseases, *image classification*, *attention module*.

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